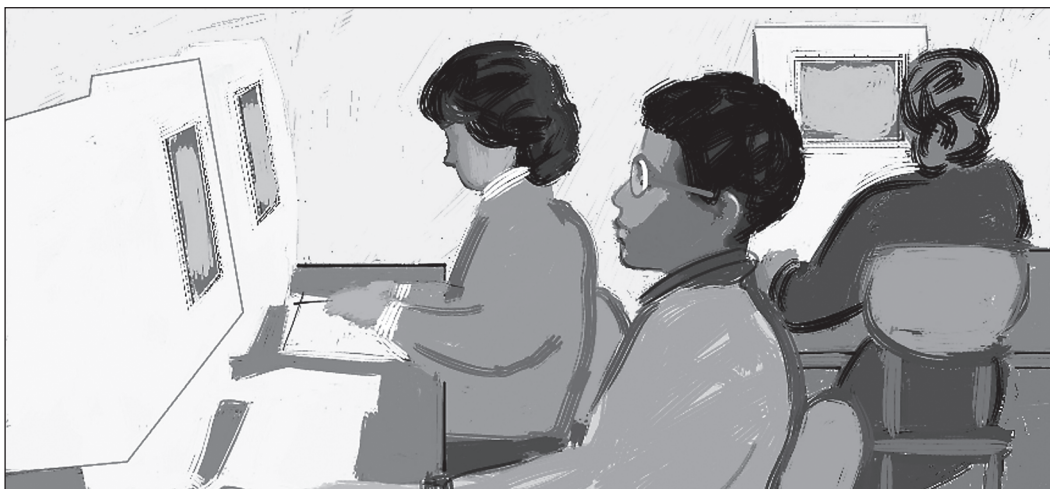


# Strategies for Adapting WebQuests for Students With Learning Disabilities

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**WebQuests are gaining popularity as teachers explore using the Internet for guided learning activities. A WebQuest involves students working on a task that is broken down into clearly defined steps. Students often work in groups to actively conduct the research. This article suggests a variety of methods for adapting WebQuests for students with learning disabilities. Various strategies include advance organizers, graphic organizers, hypertext study guides, outlines, vocabulary definitions, annotated lists of Web sites, and templates for compiling information.**

**W**ebQuests have become a viable and well-established means for students when using the online environment in a structured and guided learning activity (Dodge, 1995). Dodge defined a *WebQuest* as an inquiry-oriented activity in which learners interact with resources on the Internet. WebQuests involve students in exploring a task that has been broken down into clearly defined steps. For example, a student may research an assigned topic from the perspective of a role (e.g., researcher, biologist). Students learn as they work to compile information for the assigned task.

The Internet is sometimes compared to an encyclopedia (March, 1998); however, an encyclopedia is organized,

researched, edited for bias, and written by professionals. Material on the Internet, on the other hand, can be unorganized, full of opinion, and developed by anyone (March, 1998). When educators use the Internet as an instructional tool, they must provide some structure and organization to class assignments and projects. A WebQuest can provide this by giving students the online resources they need to effectively navigate the Internet rather than randomly searching, or surfing, it. Sources students need to complete assigned tasks, such as Web documents, communication access to experts, and searchable databases, are embedded in the WebQuest itself.

Although WebQuests may include specific Web sites identified for an instructional activity, students with learn-

ing disabilities (LD) still may be confused by complex sentences, difficult vocabulary, and the organizational structure of a typical Web site. These students may find it difficult to identify key information needed to research a task presented in a WebQuest. Because most WebQuests are developed for typical students, they can be cumbersome and inaccessible for students with LD. Due to the poor reading and study skills that characterize many of these students, alternative strategies to manage the overwhelming amount of detail found in content area textbooks have been recommended (Higgins, Boone, & Lovitt, 2002).

Research supports the efficacy of using a variety of strategies to modify or supplement textbook material used in the special or general education classroom (Horton & Lovitt, 1989; Knight & Wadsworth, 1994). The strategies can be implemented when assigning reading material on the Internet as well. These strategies include reducing the reading difficulty level and providing study guides, concept maps, advance organizers, and graphic organizers. In a WebQuest, the modified materials can be used as a separate supplement or handout or as an online document included in the development of the WebQuest.

## What Is a WebQuest?

A WebQuest is a structured, online instructional tool designed around a research task. It incorporates a list of Web sites that are used to complete the task. The goal of the WebQuest is to focus the student on using the information rather than looking for it. A well-designed WebQuest will involve the student in the processes of analysis, synthesis, and evaluation (Dodge, 1995). Critical components of the WebQuest are

1. an introduction,
2. an interesting research task,
3. identified Internet sources (Web sites),
4. clearly defined steps for researching the task,
5. directions for compiling the research gathered, and
6. a conclusion (Dodge, 1995).

The length of a WebQuest depends on the material covered and the complexity of the topic being researched. Dodge (1997) suggested that short-term (1–3 days) WebQuests work well; they involve comparing and contrasting events or items (e.g., dolphins and sharks, World Wars I and II). In contrast, longer WebQuests (e.g., 3 weeks or more) typically include analyzing and constructing information. A longer WebQuest might include several tasks for students to complete. For example, a WebQuest about chocolate involves the following tasks: (a) research the history of chocolate and create a timeline; (b) explore the life cycle of cocoa beans and create a flowchart; (c) ex-

plore a major company that produces chocolate and report the information; (d) develop a “brainstorm web/map” for developing your own chocolate business; (e) design a business card for your company; and (f) develop a digital portfolio to present your results (<http://www.btc.org/tutorials/WebQuests/chocolate/index.html>).

### Rationale for Using WebQuests as an Online Learning Tool

The online environment provides the means for students to access large amounts of information not previously available in a typical classroom. Often, teachers give students a task (e.g., “pick two animals and compare and contrast them”) to research online. Without identified Web sites provided to complete the task, students can spend large amounts of time navigating the Web to find appropriate Web sites. Search engines often identify thousands of Web sites, and the student is left to sort through mounds of information with no structure to help complete the assignment. In contrast, a WebQuest provides

- a structured environment,
- specific steps for completing the task,
- a list of appropriate Web sites, and
- instructions for compiling data for the research project.

A well-designed WebQuest provides students with an efficient tool to conduct research, compare and contrast, and analyze a topic.

### Incorporating WebQuests Into the Classroom

WebQuests are generally not used in isolation. That is, they should be connected to the curricula or state standards being studied and linked to previous and subsequent classroom topics, themes, and activities (March, 1998). The WebQuest should not be an isolated assignment unconnected to what is being learned or studied in the classroom.

Bernie Dodge, a developer of the WebQuest model, maintains and updates a Web site (<http://webquest.org/>) that contains WebQuests organized by subject and grade level. Each WebQuest is reviewed before publication on the Web site. Teacher ratings for the WebQuests are available, and those with the highest ratings are listed first in search results for WebQuests.

When considering the use of a WebQuest, educators should assess the limitations of the technology available at their school. Specifically, they should take into account (a) access to the Internet, (b) location of computers, and (c) student home access to technology. A checklist is provided to assist educators in selecting appropriate WebQuests (see Figure 1).

1. Does the topic of the WebQuest match the theme/unit being studied in the class?
2. Is the task and are the steps to complete the task appropriate for the grade level of students?
3. Is the vocabulary used in the WebQuest easily understood by the students?
4. Are the Web sites identified in the WebQuest all active and working links?
5. Are the students asked to compile the information gathered into a meaningful product that is age-appropriate based on their learning abilities?
6. Does the WebQuest require students to work in cooperative groups in order to research a task or are students working independently to research the task?

**FIGURE 1.** Sample checklist for teachers to use when selecting a WebQuest.

### Advantages of Using WebQuests for Students With Disabilities

Research suggests that students with disabilities who use technology are more highly motivated and complete more assignments when using the technology (Bahr, Nelson, & VanMeter, 1997). Thus, a WebQuest is a tool with the potential to increase motivation by providing students with resources with which to work (i.e., the Internet). The Internet can provide students with up-to-date information and often visually stimulating animation and graphics. The links within Web sites can take students directly to information they need to complete a task or solve a problem. When students use a textbook, however, they must use the table of contents or move page by page to identify key information. This process can be cumbersome and confusing for students with LD (Higgins et al., 2002). In contrast, WebQuest assignments can be designed around current real-world events or areas of interest. Topics dealing with issues currently in the news, and likewise represented on the Internet, provide an exciting and motivating lesson for students to explore in the online environment (March, 1998).

### Limitations of Using WebQuests for Students With Disabilities

Students with LD often experience a gap (e.g., one to three grade levels behind peers without disabilities) between their reading ability and the required reading materials in their classes (Mastropieri, Scruggs, & Graetz, 2003). Many textbooks contain large amounts of detail and new vocabulary (Mastropieri et al., 2003). Often, the textbooks are cluttered in appearance, causing students diffi-

culty in discriminating between important information and insignificant details.

These same concerns can arise in a WebQuest. For example, some Web sites are cluttered and contain too much information. Students with LD who are viewing these sites may find it difficult to identify the key information needed to research a task. Thus, Web sites must be carefully selected for inclusion in a WebQuest.

The average readability level of material on U.S. state and federal Web sites is at the 11th grade. However, according to national literacy statistics, half of U.S. citizens read at the 8th-grade level or lower (*Fourth Annual E-government Survey*, 2003). Because of the readability issue, educators need to provide supplementary materials or handouts or embedded hypertext links in the WebQuest.

A *hypertext* link is a word, phrase, or image that is highlighted by the browser (e.g., underlined, different font color), indicating to the reader that more information is available by clicking on that item. The hypertext link automatically transfers the user to the document (or image) to which it is referenced (for more information about hypertext links, go to <http://www.htmlgoodies.com/primers/html/article.php/3478171#how>).

Screen reader software is also a suitable adaptation for students with LD (Bisagno & Haven, 2002). In a classroom setting, teachers can make or acquire an audio recording of a text. However, in an online environment, software can be used to translate text in Web pages into synthesized speech. For example, Text Aloud (2004) is text reader software that uses a text-to-speech converter with humanlike voices. Read & Write Gold (2004) is another example of text reader software and has additional components such as one that highlights each word as it is read aloud, word prediction features, and an online talking dictionary to aid in the writing process.

WebQuests also must be structured to meet Section 508 standards, which ensures that people with disabilities have the same or comparable access to electronic and information technology as do people without disabilities (Section 508, 2006).

In addition, WebQuests must be written clearly so that students with LD will understand the assigned task. The adaptations or supplemental materials can be embedded in the construction of a WebQuest to provide clarification for these students.

### Modifying WebQuests for Students With LD

Research-based teaching strategies can be used to make a WebQuest more accessible for students with LD. Several strategies, such as study guides, advance organizers, and graphic organizers, help students comprehend and identify key information (Horton & Lovitt, 1989; Lovitt & Hor-

ton, 1994; Mastropieri et al., 2003). Additional strategies that are effective include highlighting or underlining words and providing help in the form of words decoded by syllables, vocabulary definitions, and short, easy-to-read explanations (Knight & Wadsworth, 1994). Modifying a WebQuest for students with LD is no different from modifying any learning material, and it is often made easier through the use of technology (Higgins et al., 2002).

### Creating WebQuest Study Guides

Study guides are structured outlines that provide questions that students use to identify key information from text (Lovitt & Horton, 1994) and are an effective method to help students extract information from text (Horton & Lovitt, 1989). The study guide should be designed in a hypertext format. The questions or key words should be highlighted (e.g., underlined, different font color) and contain a link to the Web site that will answer the question. When the student clicks on a hypertext link, he or she is automatically transferred to the hyperlinked document (or image, etc.). Study guides using a hypertext link help students identify key information for the task without wasting valuable time. Whether a study guide is constructed as a paper worksheet or as a digital guide with hypertext links, it should incorporate design elements such as selection of appropriate content and consideration of student ability (Jarrett, 1999; Latham & Latham, 1998; Lovitt & Horton, 1987; Tierney, Readence, & Dishner, 1985; see Figure 2).

### Creating WebQuest Advance Organizers

An advance organizer serves as an introduction to content or a lesson and usually contains the most important information in a passage (Griffin, Malone, & Kameenui, 1995). It can be an outline or paragraph in which the main concepts are linked to other concepts.

Advance organizers are an effective method to introduce content and can be used similarly to introduce a WebQuest (Rinehart & Welker, 1992). An outline of the steps needed to complete the WebQuest should be constructed in a format that is easily understood by the students (e.g., by using familiar vocabulary). Individual Web sites contained in a WebQuest also can contain advance organizers. For example, a few Web sites that could be used to research a task could be selected and a paragraph constructed as an introduction for each site. Then, an outline of the introductions could be developed for the students to follow as they access the Web sites. This outline would serve as an organizer as the students search the Web sites for information.

### Creating WebQuest Graphic Organizers

A graphic organizer is defined as a verbal or visual representation of key vocabulary or content information (Lov-

1. Analyze the material to be read for subject matter and level of difficulty.
2. Select the content to be emphasized during the lesson.
3. Decide on the processes that students must use in acquiring the content.
4. Consider student ability to read, write, listen, and organize in relation to the content and processes emphasized.
5. Vary the structure of study guides with respect to question type, format, and method of implementation to increase chances that the learning will generalize.
6. Make the study guides as aesthetically pleasing as possible.

**FIGURE 2.** Research-based suggestions for developing study guides.

itt & Horton, 1994). New information that is linked to previously learned material is easier for students to understand and comprehend (Horton & Lovitt, 1989; Willerman & Mac-Harg, 1991). Horton and Lovitt (1989) have identified five steps to follow when creating graphic organizers for students with learning disabilities:

1. select and divide chapters to be modified into passages of about 1,500 words;
2. construct an outline of the main ideas in the reading passage;
3. choose a graphic organizer format that fits the structure of the information (e.g., triangle, circle, square);
4. within each shape, place single words or phrases in a hierarchical structure; and
5. prepare teacher and student versions of the graphic organizer.

These same steps can also be applied to a Web site in a WebQuest. After reviewing a Web site, an outline of the site's main ideas should be constructed. From this outline, an appropriate graphic organizer can be developed to structure the information. Inspiration (2006), a software tool for creating graphic organizers, has been found to be an effective organizational tool for students with LD (Anderson-Inman & Zeitz, 1993). This software provides templates with shapes and lines already constructed for creating visual *webs* of related information. You can also create graphic organizers from scratch by selecting shapes and lines and adding graphics.

## Step-by-Step Guide: Modifying a WebQuest

The following guide demonstrates how to include study guides, advance organizers, graphic organizers, and other



### Advance Organizer for a Shark WebQuest

Since the movie *Jaws*, a shark is seen as a dangerous eating machine. However, facts do not support this. In 2006, there were 62 shark attacks in the world, and only 4 of these attacks were fatal (<http://www.flmnh.ufl.edu/fish/sharks/statistics/statsw.htm>). More people die from choking on their dinner than they do from being attacked by a shark. However, some people won't swim in the ocean because of sharks. Fishermen have killed many sharks.

It is your job to decide the fate of sharks. Should these sea animals be saved, or should fishermen be allowed to continue to kill them?

1. Research the question: Should sharks be killed or should they be protected?
2. In your learning group, pick a topic to research:
  - a. Shark conservation and endangered sharks
  - b. Shark poaching
  - c. Shark anatomy
  - d. Types of sharks
  - e. Shark attacks
  - f. Evolution of sharks
3. Write two questions that you want to research for your topic.
4. Look at the online resources and identify two Web sites that talk about shark attacks.
5. Print out the online resources and highlight information dealing with shark attacks.
6. Answer the two questions you wrote for your topic.
7. Meet with your group to put the information together to present to the class.

**FIGURE 3.** Sample of an advance organizer and outline for a WebQuest.

strategies in the adaptation of a WebQuest for students with LD. Based on the varying abilities of the students, one or more of the strategies can be selected and incorporated into an existing WebQuest or in the development of a new WebQuest.

### Identify a WebQuest

Once an area for research is identified, a search of the Internet for related WebQuests should be conducted. This can be done by going to Google.com and typing in the term *WebQuests*. This will identify generic WebQuests or templates to use in the development of WebQuests. For specific content area WebQuests, go to Google.com and type in *WebQuests* and the content area (e.g., *science*, *sharks*) for which a WebQuest is needed. A Web site that contains a comprehensive list of reviewed WebQuests is found at <http://webquest.org>.

### Develop an Advance Organizer

Once a WebQuest is identified, develop an advance organizer. This can be in the form of a paragraph introducing the topic, or it can be in the form of an outline. For a sample paragraph and outline introducing a WebQuest about sharks, see Figure 3.

### Identify a Topic to Modify

Identify one or two topics, tasks, or roles (depending on the task of the WebQuest) to modify for students who may have difficulties completing the WebQuest without extra support or assistance. If possible, ask students to identify topics that interest them.

### Develop a Graphic Organizer

Print out for the student the specific WebQuest questions relating to the topic selected for modification. From this printout, create a graphic organizer to visually represent the questions. Provide enough space in the graphic organizer for the student to fill in the information collected. For an example of a graphic organizer that visually displays the questions of a topic, see Figure 4. The student should use the graphic organizer to record his or her answers for the WebQuest.

### Develop a Partial Outline of Questions and Answers

A partial outline can serve as a guide for students as they move through a WebQuest. The partial outline helps students organize the information. To create a partial outline for the questions of a topic in the WebQuest, pick key words or concepts and list them in an outline format (e.g., "Four most dangerous sharks," "Shark attacks"). Underneath each concept, list letters in a column to indicate the number of responses needed. Further assistance can be provided by giving the first letter of the answer and the number of letters contained in the word (e.g., "M \_ \_"). See Figure 5 for an example of a partial outline.

### Develop a List of Web Sites

To help students narrow down the number of Web sites listed in a WebQuest, identify specific Web sites for them to use as they answer the questions. Prepare an annotated list of the Web sites (i.e., one to two sentences describing the contents of each Web site). A further modification is to provide the questions and the specific Web site for the students to use when answering each question. This will provide them with guidance as they move through a WebQuest and will direct their search of the Internet. In-

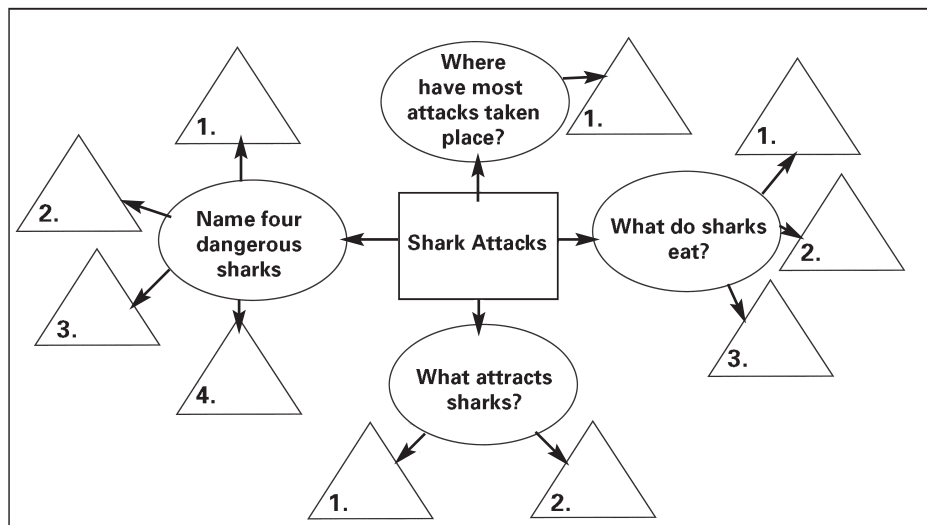


FIGURE 4. Sample of a graphic organizer containing the questions for a task.

formation on criteria to use when evaluating Web sites can be found at <http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/Evaluate.html> (Barker, 2007).

### Develop a List of Vocabulary Words

Because the Internet is mostly a text-based environment, students may have difficulty reading and comprehending the information they find. Prior to assigning a WebQuest, create lists of vocabulary words for specific students. Whereas it may be cumbersome to identify all of the difficult vocabulary in a Web site, the area in the Web site that contains the answers to the WebQuest questions can be targeted.

Once you have developed the vocabulary list, provide the definition and the pronunciation for each vocabulary word. The list should also contain information for accessing the specific screen in a Web site where the vocabulary word is found. In addition, teachers could incorporate this strategy when developing a screen-shot worksheet (e.g., a printout from a computer display showing particular information) that shows students exactly where to find the information in the Web site. For a digital WebQuest worksheet, the actual Web site that contains the answer can be modified. Also, key words can be underlined and defined. See Figure 6 for an example of a digital worksheet.

### Develop a Hypertext List of Questions for the Topic

A hypertext list of questions can be embedded in the WebQuest. To create these layered questions, key words in each question should be identified and then made into a hypertext link. When the student selects the key word,

### Shark Attack Questions

1. Four most dangerous sharks
  - a. M\_\_\_ Sharks
  - b. G\_\_\_\_\_ Sharks
  - c. S\_\_\_\_\_ Sharks
  - d. P\_\_\_\_\_ Sharks
2. Most attacks occur on
  - a. O\_\_\_ Island

FIGURE 5. Sample of a partial outline of questions for a WebQuest task.

Most shark attacks can be explained by feeding stimulation, mistaken identity, or self-defense.

Stim•u•la•tion: to excite.

Mis•tak•en: to think that someone or something is another person or thing.

Self-de•fense: to protect one's life from danger or enemies

FIGURE 6. Sample of vocabulary words defined.

he or she is then taken directly to the Web site that is necessary to answer the question. See Figure 7 for a sample of questions with hypertext links identified.

## Develop a WebQuest Study Guide

As mentioned previously, a study guide is a structured outline that provides questions that students use to identify key information from text (Lovitt & Horton, 1994). Although the resources used are different (textbook vs.

### Shark Attack Questions

1. What do sharks eat?
2. Name four dangerous sharks?
3. Where have most attacks taken place?
4. What attracts sharks?

**FIGURE 7.** Sample of questions with hypertext link.

*Note:* The hypertext links (underlined words) take the student to the specific Web site necessary to answer each question.

Web site), the process for structuring a study guide for a WebQuest is similar. For example, when creating a study guide using a textbook, a teacher might identify the page number and even the paragraph in which an answer can be found (e.g., page 21, paragraph 3). Similarly, when creating a study guide using a Web site as a resource, a teacher might identify the Web site (e.g., Name/URL), the link within the Web site, and the area on the Web site in which the answer can be found. The study guide can be developed and printed out to guide the student while he or she is locating the information on a Web site to answer specific questions. A sample study guide worksheet that students can use to move step-by-step through a WebQuest to answer a specific research question is shown in Figure 8.

When creating a step-by-step guide to assist students in identifying key information, specific detailed instructions for locating Web sites and key information within Web sites should be used (e.g., click, scroll, link). Students should also be familiar with this terminology before they

### WebQuest: "Should we fear sharks?"

<http://www.nevada.edu/~skylar/SHARKQUEST.HTML#resource1>

#### Step 1 IDENTIFY QUESTION

Click on "Questions," Click on "Shark Attacks," Identify Question #1.

1. Where have most of the attacks taken place?

#### Step 2 IDENTIFY WEB SITE

Scroll down to the "Internet Resources" section of the WebQuest.

Click on the link for "Shark Attack Statistics"

<http://www.sharkattackphotos.com>

#### Step 3 IDENTIFY THE WEB SITE LINK

- A. Click on the link on the right hand side, "Shark Attacks—Shark attacks grouped by region and safety advice concerning shark attacks and statistics and maps of shark attacks
- B. Scroll down to the end of the page

Click on the link on the right side, "Shark Attack Statistics"—Maps detailing shark attack statistics grouped by region, also a list of facts of just how many shark attacks there are each year and other interesting stats.

#### Step 4 IDENTIFY THE ANSWER

- A. Click on the picture of a map of the United States with the heading, "Shark Attacks 1670–2001."

#### QUESTIONS:

Which region has had the most shark attacks? \_\_\_\_\_

How many shark attacks has that region had? \_\_\_\_\_

Which state in that region has had the most shark attacks? \_\_\_\_\_

How many shark attacks has that state had? \_\_\_\_\_

**FIGURE 8.** Sample of a study guide worksheet to supplement a WebQuest.

receive the study guide. A teacher should consider the following steps in creating a step-by-step study guide worksheet to assist students in identifying key information in a Web site:

1. Identify a role or task within the WebQuest.
2. Identify the questions or task that the student will be expected to answer or perform. Type a description of where to find the question in the study guide. For example, "Click on *Questions*, click on *Shark Attacks*, and identify Question #1."
3. Identify a Web site on which the answer to the question can be found. Type a description of where to find the Web site. For example, "Scroll down to the *Internet Resources* section of the WebQuest. Click on the link for *Shark Attack Statistics*."
4. Identify the Web site link that will take the student to the area within the Web site where the answer is to be found. Type a description of where the link is within the Web site. For example, "Click on the link on the right-hand side, *Shark Attacks*; then scroll down to the end of the page. Next, click on the link on the right-hand side called *Shark Attack Statistics*."
5. Give the student questions to answer once he or she has found the area within the Web site where answers are to be found.

## Conclusion

WebQuests provide a structured and guided learning activity for students to use as they conduct research in an online environment. Even with teacher-selected Web sites provided, students with LD still may experience difficulties with the complex sentences, vocabulary, and organizational structure of the Web sites.

To increase the accessibility of WebQuests for all students, strategies must be embedded in the development or use of the WebQuest. The strategies presented describe methods by which WebQuests can be modified or adapted for students with LD to increase comprehension and task completion. The goal of the strategies is to facilitate student identification of key information found on the Web sites.

The use of online learning activities is increasing in general and special education classrooms. WebQuests are one method by which online instruction can be presented in a structured manner. The modification of a WebQuest for use by students with LD can be accomplished through the use of research-based strategies. These strategies, when applied to the online learning environment, increase student access to a vast amount of information. The use of these strategies can help students use the Internet more effectively while reducing their chances of getting lost in a sometimes unfriendly information space.

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